

WEATHER FORECASTING ANNOUNCEMENT AND DISPLAY SYSTEM

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ABSTRACT

The monitoring of weather is really helpful in agriculture sector for rural areas where people are illiterates to access weather conditions at small instants and to prevent their fields from unexpected changes in weather conditions.

This paper propose the design of data information for weather changes that occurs frequently and announcement of this information in Hindi and this data is also displayed on LCD for the betterment of farmers. For this number of sensors are connected to the microcontroller which will sense the parameters such as temperature, hotness, coldness, humidity etc. from the nearby surroundings and then the sensed data will be matched with the manually stored data of last few years.

Then the matched condition will be announced with the help of a voice module which will announce the information in Hindi for the farmers to be easily understood. And then for better performance the announced information will also be displayed on the display unit. Aim of the project is to monitor weather conditions, including temperature, atmospheric humidity, and solar light intensity through various sensors.

KEYWORDS: *Voice IC, Announcement system, Microcontroller, Display unit.*

1. Introduction

Throughout time we have been fascinated by the weather studying signs of change and making and acting on predictions. Today we can link modern instruments to computers to reduce human error and automate record keeping.

This project is a fine combination of analog and digital electronics.

We have used Microcontroller as a main component of the project. Now a Microcontroller has become a main component of many of the electronic circuits. Also Liquid Crystal Display (LCD) and sensors are used on major basis for the display and sensing purpose. This project consists of two basic modules. First is "Data monitoring" & other is "Data Displaying" A display unit will show the value of parameters. This will help for the person to know the values. The other module is named as parameter monitoring and for this purpose we are going to use various sensors, which will be connected to ADC.

Now the major part of this project is to announce the weather condition which is in Hindi. For this we are going to use the announcement system that announces the voice which was already stored in the microcontroller IC with the help of voice IC.

An announcement system is also known as a public address system (PA system). It is an electronic sound amplification and distribution system with a microphone, amplifier and loudspeakers, used to allow a person to address a large public, for example for announcements of movements at large and noisy air and rail terminals or at a sports stadium and here it is used for announcement of weather conditions. The term is also used for systems which may additionally have a mixing console, and amplifiers and loudspeakers suitable for music as well as speech, used to reinforce a sound source,

such as recorded music or a person giving a speech or distributing the sound throughout a venue or building.

It is a re-recording voice IC. The device combines a small size with low power consumption, non-volatility, and ease-of-use for a cost effective solution to voice recording and playback. It has many features such as-

- Single message of 20 to 30 seconds, with external resistor selection
- Chip enable pin for simple message expansion
- User-friendly, easy-to-use operation
- Non-volatile Flash memory technology

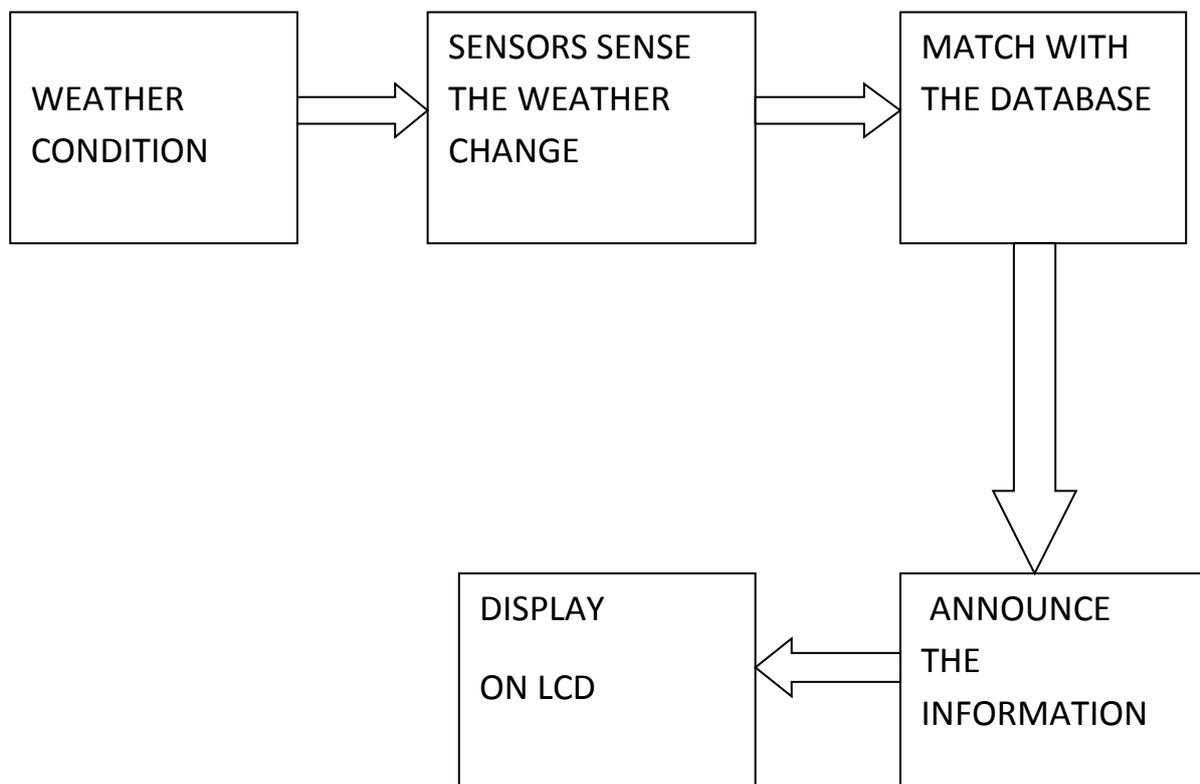
As the circuit is used to announce the information in Hindi. So a speech to speech language translator is used here.

In the nascent stage of developing a personalized interpreter, we develop a prototype which uses a speech processing hardware and online translators to provide the user with real time translation. Speech processing hardware works on the principle of 'compare and forward', i.e., a database is already stored in the unit which is used for comparing with the input speech and the result is forwarded for further processing. The need arises from the inability of dictionaries and human translators to suit our needs for better communication. In this situation the prototype proposed will suffice the purpose reasonably well and minimize the communication inefficiencies.

The input speech first goes to the speech IC of the speech processing unit. This IC works in two modes: - (i) Training: Stores the database. (ii) Recognition: Compares with the database.

And at last the weather forecast is to be displayed on a screen for better performance. So for that a LCD can be used. Here we have used 16 x 2 Alphanumeric Display which means on this display we can display two lines with maximum of 16 characters in one line.

2. Proposed model



3. Benefits of Proposed Model

The information which we get through this system helps farmers to take decisions for various agricultural activities-

- Field preparation
- Irrigation
- Fertilizer application
- Harvesting operations

4. Literature Review

Over the course of history, weather forecasting methods have greatly advanced both in terms of their accuracy and reliability. The development of new scientific observation methods and numerical models has also increased the general public perception of weather forecasting.

Tsung chen et al. [1] proposed a weather forecasting system based on wireless network and the mobile device. The idea here in this paper is to designing and implementing a mesoscale weather forecasting system based on the mobile surrounding intelligence. The information regarding the predicted weather may be calculated from the past weather information and the position of the user's location can be located with the help of GPS sensor present in the mobile device. The forecasting in this paper is done using the K Nearest Neighbour (KNN) and extrapolation and the result is predicted.

Omary et al. in [2] discussed about the interactive predictive system. Here a country named Jordan which has limited or rare resource in under forecast and the forecasting is done with numerical weather prediction model. Precipitation forecasting is done with the help of data mining based on the historical weather records. This paper introduced a weather prediction model, based on HIRLAM and ALADIN models, which is focused to predict the weather in geographic area in Jordan. HIRLAM is the operational High Resolution Limited Area Model, aimed to forecast short range weather only while ALADIN model is constructed to the technique of compatibility with the Global model.

The first aspect of the advancements is the collection and assimilation of weather data. There are several more efficient and time-sensitive data collection methods that have been invented. Among the earliest scientific observational methods were the radar and satellite stations. For example, the invention of the Numerical Weather Prediction, NWP, data generating model made it much easier to use information from past information and then assimilate it with current data for a much more comprehensive prediction (Lynch, 2006). Estimates of the state of the atmosphere could easily be made using partial observations made in different time periods. However, the greatest challenge in observation is that some areas are still poorly and not frequently observed and this compromises prediction accuracy.

Vaisala weather transmitter WXT520 named as on the scientist use the technology for weather forecasting in which the data from the data logger is then collected by pen drive and from pen drive it will take once in month or once in two month, so it is necessary to continuously take data for day to day analysis purpose during forecast. For taking data manually go to the forest area and copy that data from pen drive, to avoid this a new system is designed in which data is transmitted wireless continuously to control room from sensor located at forest area.

Muthoni et al. in [3] discussed a weather monitoring system which was sensor based, called SenseWeather for Kenya. The design and implementation, deployment and sensor calibration of SenseWeather is presented in this paper. It is designed to integrate weather readings from stations with different parameters like pressure, wind speed etc. and recorded by the sensors. This application is complete system made up of several sub-systems, implemented by Java-based development framework known as Java Agent Development.

5. Comparison

In the past, the general perception and assumption regarding weather forecasts was that they would, more often than not, be wrong. There has been a significant improvement in terms of accuracy compared to 20 years ago. For instance, a 3 day atmospheric pressure forecast in the present day is as accurate as a 1 day forecast to decades ago. The dependability of a weather forecast is indicated by how accurate a long term forecast is. One day forecast have been possible for a long time, however, advancement in scientific methods have made forecasts as long as a week to be accurately determined. Whereas now-a-days weather forecasts on the time to time basis means the sensors used in the system are so much sensitive so they just sense the conditions and accordingly make the announcement.

6. Conclusion

The aspect of weather forecasting advancements has been the various ways, media or channels through which predications or forecasts are communicated. This project help in many ways like it is very helpful for farmers in order to do better cultivation. Helps them knowing proper condition of weather so that they can take appropriate decisions for their welfare. This project is basically for rural areas, where major part is agriculture, and it is so much beneficial for local people. The main advantage of this announcement system is that it announces the information in Hindi which can easily be understood. And with this it adds an advantage which is- displaying the conditions on screen also for better understanding.

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